

What is Claimed Is:

1. A circuit breaker for providing protection in an electric power distribution system, the circuit breaker comprising:

separable contacts;

an operating mechanism opening the separable contacts when actuated;

a trip unit comprising a thermal/magnetic trip device producing a thermal trip by actuating the operating mechanism in response to persistent overload conditions and producing a magnetic trip by actuating the operating mechanism in response to overcurrent conditions; and

a monitor providing a thermal trip indication when the separable contacts are opened by the thermal trip and providing a magnetic trip indication when the separable contacts are opened by the magnetic trip.

2. The circuit breaker of Claim 1, wherein the thermal/magnetic trip device comprises a bimetal heated by current passing through the separable contacts and the monitor comprises a trip sensor sensing opening of the separable contacts, a temperature sensor sensing temperature of the bimetal, a processor generating a thermal trip signal in response to a sensed temperature above a selected value when the separable contacts open, and output means generating the thermal trip indication in response to the thermal trip signal.

3. The circuit breaker of Claim 2, wherein the monitor further comprises an overcurrent sensor sensing current through the separable contacts and the processor generates a magnetic trip signal in response to a sensed current signal above a selected value when the separable contacts open, and the output means generates the magnetic trip indication in response to the magnetic trip signal.

4. The circuit breaker of Claim 3, wherein the output means comprises a thermal trip light emitting diode generating the thermal trip indication and a magnetic trip light emitting diode generating the magnetic trip indication.

5. The circuit breaker of Claim 3, wherein the output means comprises communication means for communicating the thermal trip indication and the magnetic trip indication remotely.

6. The circuit breaker of Claim 1, wherein the trip unit further comprises electronic trip circuitry generating an electronic trip signal indicating at least one of an arc fault and a ground fault in the electric power distribution system and a trip actuator responsive to the electronic trip signal to actuate the operating mechanism, and wherein the monitor provides at least one of an arc fault trip indication and a ground fault trip indication in response to the electronic trip signal.

7. The circuit breaker of Claim 6, wherein the electronic circuitry includes both an arc fault trip circuit and a ground fault trip circuit and the monitor provides both an arc fault trip indication and a ground fault trip indication.

8. The circuit breaker of Claim 7, wherein the monitor comprises a surge detector detecting a surge in voltage in the electric power distribution system and provides an indication of the surge.

9. The circuit breaker of Claim 7, wherein the monitor comprises a trip sensor sensing opening of the separable contacts, a temperature sensor sensing the temperature of the thermal magnetic trip device, an overcurrent sensor sensing current above a selected value through the separable contacts, a processor generating a thermal trip signal in response to the temperature secured by the temperature sensor above a selected value when the trip sensor senses opening of the separable contacts, generating a magnetic trip indication with the current of the overcurrent sensor above a selected value when the trip sensor senses opening of the separable contacts, generates an arc fault trip signal in response to an arc fault signal from the arc fault circuit when the trip sensor senses opening of the separable contacts, generates a ground fault trip signal in response to a ground fault signal from the ground fault circuit when the trip sensor senses opening of the separable contacts, and output means generating the thermal trip indication in response to the thermal trip signal, the magnetic trip indication in response to the magnetic trip signal, an arc fault trip indication in response to the arc fault trip signal, and a ground fault trip indication in response to the ground fault trip signal.

10. The circuit breaker of Claim 9, wherein the output means comprises a thermal trip light-emitting diode providing the thermal trip indication, a magnetic trip light emitting diode providing the magnetic trip indication, an arc fault

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light emitting diode generating the arc fault trip indication, and a ground fault light emitting diode generating the ground fault trip indication.

11. The circuit breaker of Claim 9, wherein the output means comprises communication means for communicating the thermal trip signal, the magnetic trip signal, the arc fault trip signal, and the ground fault trip signal remotely.

12. The circuit breaker of Claim 9, wherein the output means provides a failure to trip indication in response to an arc fault or ground fault signal in the absence of a tripped indication from the trip sensor.

13. The circuit breaker of Claim 12, wherein the monitor comprises non-volatile memory retaining the thermal trip indication and the magnetic trip indication in the event of loss of power.

14. The circuit breaker of Claim 10, wherein the arc fault trip light emitting diode or the ground fault trip light emitting diode flashes in response to an arc fault trip signal or a ground fault trip signal, respectively, in the absence of a tripped indication from the trip sensor.

15. A circuit breaker for providing protection in an electric power distribution system, the circuit breaker comprising:

a housing;

a trip unit within the housing responsive to selected current characteristics for interrupting current in the electric power distribution system; and

a monitor comprising:

a surge detector within the housing generating a surge signal in response to detection of a voltage surge in the electric power distribution system; and

an output device generating a signal indicating the voltage surge in response to the surge signal.

16. The circuit breaker of Claim 15, wherein the trip unit comprises an electronic trip circuit and a power supply energized by the electric power distribution system and supplying power to the electronic trip circuit, and wherein the surge detector detects the surge in voltage at the power supply.

17. The circuit breaker of Claim 15, wherein the output means is a light emitting diode which is illuminated in response to the surge signal.